

THE FY 2000 IMPLEMENTATION PLAN FOR NWS TRAINING AND SCIENCE SUPPORT

I. OVERVIEW

The purpose of this document is to specify training and education activities for all National Weather Service (NWS) staff in fiscal year (FY) 2000 and to outline high priority training needs to be addressed for implementation in FY 2001. The requirement for the FY 2000 Implementation Plan for NWS Training and Science Support (IP00) is specified by the NWS National Strategic Training and Education Plan (NSTEP).

As per NSTEP, the process of determining and prioritizing training requirements within available budgets was coordinated by the NSTEP Field Requirements Group (FRG). The FRG representatives for the IP00 process included the Regional Scientific Services Division Chiefs or Regional Scientists and the National Centers for Environmental Prediction's (NCEP) Executive Officer. This document provides the requirements for the NSTEP Heads of Training Group to develop and/or offer the instructional components indicated herein during FY 2000. The coordination of the entire NSTEP process, including development of this plan, was facilitated by the NSTEP National Headquarters Group (NHG).

Interactions among the FRG and other members of the NSTEP Team during the IP00 process were both more frequent and more comprehensive than in FY 1999. For example, a number of meetings to define training needs in specific job duty areas, called Professional Development Series (PDS) meetings, were held during the year. In addition, members of the NSTEP Team and other experts participated in conference calls on a weekly basis during spring 1999 to prioritize these needs across all NWS positions and within a single budget. Finally, direct regional participation in the IP00 process actually involved all the regional division chiefs and their staffs.

At the conclusion of the training requirements definition and prioritization processes, the FRG recommended how the discretionary portion of the NWS Training Program budget should be allocated. In FY 1999 and in prior years, this discretionary portion was allocated according to the Modernization and Associated Restructuring Demonstration Initiative (MARDI) budget justifications.

In June 1999, the NHG learned of the plans to convert all MARDI funds into NWS base funding in FY 2000. However by this time, the FRG had already established training priorities based on MARDI budget limitations. In view of this transition, IP00

provides two tables outlining the FRG's final budget decisions. Table 2 shows the budget as determined by the FRG process (i.e., with the MARDI budget allocations included), while Table 3 shows the budget with all items formerly funded by MARDI included in NWS base funds. The budget shown in Table 3 is the version which will be implemented and tracked in FY 2000.

As a guide to the remainder of this document, a summary of definitions and terms used in conjunction with the PDS process is provided in section II. A detailed summary of training plans for FY 2000 is provided in Section III. These plans include PDS-related residence courses and distance-learning development, in addition to non-PDS programmatic training activities for which funds have been identified. A prioritized list of unfunded training requirements which exist due to budget limitations is found as Section IV. Finally, Section V describes anticipated training needs in FY 2001 and beyond.

Table 1 contains a summary of all in-residence classes to be offered in FY 2000. This summary provides details related to class size and length, funding source, slot allocation by FRG member, and itemized costs. Each class listed in Table 1 is also included in Tables 2 and 3, respectively, stratified by PDS. It is noted while some activities could easily have been placed into two or more PDSs, each activity is listed only once and has been placed in the PDS deemed most appropriate by the NSTEP Team.

II. PDS Process - Definitions and Terms

NSTEP defines a PDS as "a set of integrated instructional components and presentations which describe the skills, knowledge, and abilities necessary to fulfill a major job responsibility." Each PDS is made up of a series of Professional Competency Units (PCU) and Instructional Components (IC), which are defined as follows:

PCU: Taken together, PCUs make up the integrated set of related job skills and abilities required to fulfill a major job responsibility (i.e., PDS). Each PCU specifically defines the skills or abilities individual staff are expected to attain in a given area of job performance.

IC: ICs are the specific training modalities used to train the job skills outlined in a specific PCU (e.g., classroom, teletraining, Internet World Wide Web [WWW]). A number of different training modalities may be used to accomplish required training within each PDS and even within each PCU. While the NWS has increasingly stressed the utilization of distance-learning techniques where possible to avoid expensive travel costs and keep needed staff in the local office, it is recognized some in-residence training is still necessary. Additional details on the

PDS concept can be found at the "Meteorology Education and Training" (MetEd) home page on the Internet, which can be accessed at:

<http://meted.ucar.edu/index3.htm>

Also, as part of the PDS development effort, a new NWS Training Internet home page (NWSTRN) will be established during FY 2000 by the NWS Training Center (NWSTC) as a cross-cutting reference source for all NWS PDS training activities. NWSTRN will contain links to all currently-available PDSs, along with associated PCUs and ICs. The location of NWSTRN will be advertised to the NSTEP Team when the site becomes publicly available.

NWSTRN will be designed so staff in any NWS position can easily identify the suite of basic job skills they are expected to master. In addition, a set of Baseline Proficiency Standards (BPS) are under development for access via NWSTRN to clearly define the expected baseline level of skill for each PCU. These BPSs will assist local management in determining where operational deficiencies exist and, therefore, where supplemental training may be needed.

The following are high priority topic areas for which the FRG and/or NWS senior management have determined PDSs are needed. PDS meetings were held in several of these areas, the results of which are described in Section III. In some cases, such as with Hydrology and Engineering, Electronics and Facilities, there are several PDSs defined within the topic area itself.

The PDS topic areas below have been completely outlined.

- (1) Advanced Weather Interactive Processing System
- (2) Integrated Sensor
- (3) Convective Warning Process
- (4) Numerical Weather Prediction
- (5) Quantitative Precipitation Forecasting
- (6) Hydrology
- (7) Engineering, Electronics, and Facilities
- (8) Management, Supervision, and Leadership
- (9) Cooperative Observer/Hydrometeorological Technician Duties

The following areas require PDS development during FY 2000.

- (10) Climate Prediction
- (11) Aviation Weather Prediction
- (12) Marine Weather Prediction
- (13) Administrative Support
- (14) Fire Weather Prediction

III. TRAINING PLANS FOR FY 00

In this section, detailed training plans for FY 2000 are presented. Subsection (A) contains a description of labor and non-labor costs associated with the NWS Training Program. Per the PDS list provided at the end of the section II, subsections (B) through (K) cover training activities in the respective PDSs, while non-PDS training activities funded by the FRG are covered in subsection (L). Finally, new items which were recommended by the "Assessment of the Fiscal Requirements to Operate the Modernized National Weather Service During FY 1998 and 1999," but delayed until FY 2000 for funding, are described. As stated earlier, all funded items are presented in the order shown on Tables 2 and 3.

A. Labor and Non-Labor Costs

The first category appearing in Tables 2 and 3 is entitled Labor. Each line item in this category indicates labor costs for the three NWS training facilities: NWSTC, the WSR-88D Operational Support Facility's Operations Training Branch (OTB), and the NWS/Cooperative Program for Operational Meteorology, Education, and Training (COMET), respectively. In the case of COMET, labor costs refer only to the four NWS employees stationed at COMET.

Meanwhile, the Non-Labor category encompasses internal costs required at each training facility, including, but not limited to, facility costs, equipment, staff travel and training, rent, and supplies and materials. In the case of COMET, these costs, along with the costs of all COMET employees employed by the University Corporation for Atmospheric Research (UCAR), are included in the COMET grant. The grant supports the costs of 15 Cooperative and ten Partners projects in FY 2000; the costs of university instructors and their travel; COMET staff needed to support the COMET classroom; building and archiving case studies for use in the classroom; staff time for creating COMET distance-learning modules; and maintaining the Meted Internet site.

B. Advanced Weather Interactive Processing System (AWIPS)

An AWIPS PDS meeting was held in February 1999 at NWSTC. Three AWIPS PDSs were identified as a result of this meeting. These included Operating AWIPS, AWIPS System Administration and Maintenance, and Implementing Local Applications on AWIPS. After examining the exact nature of the training needs through the PCU definition process, the FRG determined some of these needs could be addressed via three new courses at NWSTC, entitled AWIPS System Manager, AWIPS Applications, and Weather Forecast Office (WHO)/River Forecast Center (RFC) Systems Administration. AWIPS Systems Manager will address training needs of NWS Electronic Systems Analysts to ensure reliable availability of AWIPS to

users at all times. AWIPS Local Applications will optimize local developers' ability to design and utilize AWIPS local applications, including important software and Local Data Acquisition and Dissemination utilization training. Objectives for WHO/RFC Systems Administration are to provide NWS Electronics Technicians the training they require to manage all non-AWIPS systems in the office.

The FRG has agreed to provide assistance to NWSTC in developing these courses through Field Development Teams. These teams, made up of selected field representatives, are needed in order to ensure these courses will be ready for offering as soon as possible in FY 2000. In order to meet remaining FY 2000 AWIPS training requirements, the FRG also recognized the requirement to fund attrition courses on the WHO Hydrologic Forecasting System (WHFS - see section G), as well as to provide initial training for the Interactive Forecast Processing System (IFPS), including training for local managers and focal points. IFPS Delta training will be provided for those IFPS focal points who are already familiar with existing Interactive Computer-Worded Forecasting software. Base funds will have to be used to augment existing AWIPS funding to ensure all scheduled classes are held.

Finally, the FRG has recommended funding to facilitate local provision of contractor-provided information technology (IT) systems training related to AWIPS. These funds, described in section H, will also be used to procure contract training for various local systems administration training needs.

C. Integrated Sensor PDS

The FRG has articulated the need to make available easily accessible, short summaries on the characteristics of new and derived data sets to field users and on how to utilize these data sets on AWIPS. An Integrated Sensor Training (IST) PDS meeting was held in August 1998 to outline the needs in this area. There were nine PCUs developed during this meeting, which were then prioritized by the FRG and subsequently reviewed at a September 1999 meeting. The top four PCUs (in priority order) include AWIPS Multi-Source Data Displays, Using AWIPS in the Forecast Process, Using Satellite Data and Products and Using Radar.

Some of the development for IST training will be accomplished by NOAA Cooperative Institute employees, whose salaries will be funded from the FRG's training budget. The training will be almost entirely distance learning, including supportive instructional material provided by web sites, and teletraining using VISITview software. This software provides more animation capabilities than are available on AWIPS, such as full-resolution image fading and linked animation, and features live instructor voice via telephone lines.

The IST PDS also includes advanced training on the use and interpretation of satellite data, particularly in conjunction with radar data, offered by the COMET Satellite Meteorology (Satmet) course. At least one person per office will have attended this class at the conclusion of FY 2000, including either the Science and Operations Officer (SOO), Satellite focal point, or other designated personnel. The National Environmental Satellite, Data, and Information Service also plans to continue funding a 6-month effort at COMET to develop Polar Orbiting Environmental Satellite training for Internet access by NWS forecasters.

The OTB will offer an AWIPS-based Doppler weather surveillance radar (WSR-88D) distance learning operations course (DLOC) for those NWS meteorologists and hydrologists who have not taken either the original 4-week, in-residence WSR-88D operations course or the previous DLOC training offered by the OTB. Second, OTB will offer in-residence Warning Decision Making I (WDM I) workshops at COMET geared toward those students who have taken the new AWIPS-based DLOC course. Finally, OTB will offer another in the series of distance-learning courses to provide NWS HMTs with basic WSR-88D training.

D. Convective Warning Process PDS

A Convective Warning Process PDS meeting was held in March 1999 in Norman, Oklahoma, to address training needs in this area. The goal of this PDS is to elicit a better scientific understanding of the elements involved in the convective warning process which will improve skills in decision-making and ultimately lead to better service. Six PCUs were developed during this meeting which cover the key elements of the warning process:

- * Optimize office strategies for convective warning operations
- * Analyze and assess the mesoscale environment
- * Analyze convective storms to assess storm intensity and evolution
- * The Warning Decision Process
- * Composing and disseminating the convective warning product
- * Monitoring convective warning operations.

Many instructional components for this PDS are either currently available or under development via CD-ROM or the Internet. Additionally, the FRG has requested three additional WDM II workshops on advanced radar techniques as a continuation of the series of AWIPS-based workshops begun in FY 1999. The additional workshops will allow at least one person from each field office and line unit to attend this "train-the-trainer" workshop.

E. Numerical Weather Prediction (NWP) PDS

An NWP PDS meeting was held in October 1998 to define training needs in this area. Providing NWS forecast staff with a working knowledge of NWP models is important because the overall skill of the NWS forecast program beyond the 12-hour forecast projection is driven primarily by the operational models and the skill of the forecasters to correctly interpret and use the models. At the same time, numerical models are constantly undergoing upgrades and enhancements.

The training needs for NWP are as follows:

- * Training on basic numerical model concepts.
- * Continual updates on enhancements to the operational NWP models and the impact on model performance.
- * Training on scientifically based forecast practices for assessing model initialization and using NWP guidance in the forecast process.

In order to ensure the success of this effort, two COMET post-doctoral positions have been hired and assigned to NCEP's Environmental Modeling Center to accomplish development work. These positions will support NCEP's involvement with and development of NWP training materials. They will also assist the instructional designers at COMET with developing NWP distance learning materials. Details of planned and available NWP PDS training materials can be found as a link to the Meted page's Professional Development section.

The FRG has also decided to fund two in-residence Train-the-Trainer NWP Symposia at COMET for SOOs who did not have the opportunity to attend in FY 1999.

F. Quantitative Precipitation Forecasting (QPF) PDS

The continued development of training and techniques to improve QPF is one of the top priorities identified by the NWS. The goal of the QPF PDS is to address improvement of precipitation estimation and forecasts which will contribute to improved watch and warning accuracy.

The PCUs under development for this PDS include:

- * Assess Climatology Data for Potential of Precipitation
- * Assess the Atmospheric Environment for Patterns and Conditions Leading to Precipitation
- * Evaluate and Integrate Observations/Estimates of Precipitation
- * Evaluate NWP and Value-added Guidance for Precipitation Forecasting
- * Assessing the Mesoscale Environment: Forecasting Precipitation and Timing

- * Prepare QPF
- * Prepare a trafficability forecast (for the U.S. Air Force Weather Agency)

The FRG determined the highest priority PCU was Evaluate NWP and Value-added Guidance for Precipitation Forecasting and has decided to fund the following two activities in association with this PDS:

1. Offer two in-residence heavy rainfall and flash flood symposia at COMET.
2. Create Internet-based material based on these symposia.

The symposia curriculum will be developed during the first several months of the year in time to be offered in August and September 2000. As with the NWP symposium material, lecture graphics and ready-made training packages will be developed for these symposia. The symposia will focus on the WHO's responsibility for heavy rainfall and flash flooding.

G. Hydrology PDS

The NWS Office of Hydrology sponsored a series of PDS meetings in FY 1999 to define hydrology-related training needs for meteorologists and hydrologists at NWS Weather Forecast Offices and for hydrologists at NWS River Forecast Centers. As with most other PDSs, training in association with AWIPS delivery is of the highest priority. Seven PDSs were identified, as follows:

- * Managing the Hydrology Program
- * Hydrologic Forecasting
- * Procedure Development and Model Calibration
- * Forecasting Flash-Flood Events
- * Assessing Near-Term Hydrologic Guidance and Issuing Public Forecasts
- * Extended-Range Hydrologic Forecasting
- * Assimilating Hydrometeorological Data

The highest priority activities for FY 2000 were determined from these PDSs. Among these is completing WHFS-related classroom training at NWSTC. Funding is required for student and administrative travel to the WHFS Workshop, for updating the course manual, and for the part-time course instructors who are UCAR Visiting Scientists.

The FRG has recommended funding to continue offering expert workshops at RFCs. Topics of these workshops include model calibration and hydrologic procedure development, forecasting flash floods, hydrologic forecasting, and assimilating hydrologic data. Also, funding to support WHO and RFC hydrologists taking

hydrology- and hydrometeorology-related courses at local universities will continue.

There are several new training efforts for hydrology approved for development by the FRG in FY 2000. Most of the new training will take the form of Internet-based modules developed by subject matter experts outside the NWS. Topics for development include Assessing Hydrometeorological Inputs to a Hydrologic Modeling System, Theoretical Aspects of the Rainfall Runoff Process, Operational Modeling of the Rainfall Runoff Process, and Unit Hydrograph Theory. The FRG also approved funds for developing a new course entitled Managing a WHO Hydrology Program to be offered at NWSTC starting in FY 2001.

The FRG has approved funding for a final series of Hydromet courses to be offered at COMET. This course, designed primarily for operational hydrologists, provides an overview of hydrometeorology and meteorological events producing both flash floods and systemic flooding. Finally, two INFORMIX overview classes will also be held at NWSTC for RFC staff.

H. Engineering, Electronics, and Facilities PDS

A PDS meeting to define needed training for these topics was held at NWSTC in spring 1999. At the meeting were representatives from all regional Systems Operations Divisions, the NWSTC, and the NHG. There were 11 new PDSs identified as a result of this meeting, which included:

- * Facilities Maintenance
- * Facilities Management
- * Environmental Compliance
- * Safety and Health
- * NEXRAD Maintenance
- * ASOS (Pace) Maintenance
- * NWR Maintenance
- * Upper Air (Profiler) Maintenance
- * Other Data Acquisition Systems Maintenance
- * IT Systems and Network Support
- * General Engineering Skills

As indicated by these PDSs, critical training needs focus on systems personnel being able to understand, utilize, and properly integrate the many new and derived data sets now available, transition the work force from hands-on to systems support, and enable them to take responsibility for ensuring adequate and economical facility maintenance to meet operational requirements.

Much of the training need will be accomplished via classes offered by the NWSTC Engineering and Electronics Division.

Descriptions of each of these classes can be accessed via the NWSTC Home Page at <http://www.nwstc.noaa.gov>.

As mentioned in the description of AWIPS PDS activities, the FRG has also approved additional funds to allow field staff to take fundamental contractor training in IT systems. Examples of such training include computer courses on Introduction to Unix and C++; Internet and Internet-related training; telephone system training; and PC, workstation, and server operating systems training. In addition, funding has been identified for local facilities maintenance training to ensure field staff know how to repair vital mechanical and electrical systems; are aware of good maintenance practices; and possess a clear knowledge of how to comply with building, electrical, mechanical, environmental, and safety codes and regulations.

I. Management/Leadership PDS

The NWS Chief Financial Officer's (CFO) office, NSTEP team, and the NWSTC is working together to develop a plan for NWS Management and Leadership training. The training will include Management and Supervision Training, Team Leader training, and Team Member Training. In particular, leadership skills will be stressed strongly to achieve the goals of the NWS Strategic Plan, namely, the achievement of a "seamless suite of products and services" and excellent customer service.

Leadership training will utilize subject matter experts outside the NWS to teach courses at the NWSTC. All supervisors and managers are expected to complete this training by 2005. A business plan for leadership training is now being completed, and the FRG has planned the first prototype leadership class to be held at NWSTC during the second half of FY 2000. This course will replace the NWSTC Team Leadership course taught in previous years.

Also included in this PDS is the NWSTC course entitled Cooperative Network Operations, which provides training for those managing the Cooperative Observing Program. The course includes details on program requirements, purposes, and objectives with topics including observer recruitment, equipment installation and maintenance, and network data quality control.

J. Climate Prediction PDS

The need for climate training for NWS field forecasters has become increasingly apparent during the last couple of years due to the highly publicized El Niño and La Niña events. While forecasters at NCEP's Climate Prediction Center (CPC) are responsible for diagnosing and predicting short-term climate fluctuations, field forecasters need to be able to accurately

assess the impact of the large-scale climate fluctuations on local weather. Adequate climate prediction training will also ensure NWS can fulfill its responsibilities to assist agencies both inside and outside the Federal Government in coping with such climate-related problems as food supply, energy allocation, water resources (both locally and nationally), and responding to local questions from the media and public.

Climate training will be developed by personnel from CPC during FY 2000 with emphasis on climate variability and prediction techniques. A PDS meeting will be held early in FY 2000 to coordinate a proposed course outline with the FRG and to convert the outline into PDS format. Current plans call for utilizing distance learning for climate training.

K. Aviation Forecasting PDS

The FRG has approved maintaining one of the distance-learning development teams at COMET to continue production of Internet modules on important aviation forecasting topics. A series of three modules on the Forecasting Aviation Icing PDS was completed in FY 1999. The team has also begun developing a series of modules on Low Altitude Clouds and Fog for Aviation Operations PDS. This effort at COMET is co-sponsored by the U.S.Navy and U.S.Air Force. Modules on Advection Fog and Radiation Fog will be released in FY 2000.

L. Other Non-PDS Training Activities

Teletraining Risk Reduction: This funding supports efforts to explore new teletraining techniques in preparation for potential implementation of video teletraining. Costs may include the purchase of hardware and software required to facilitate these tests.

Teletraining Communications: This supports routine commercial bridging costs for provision of teletraining sessions by the three NWS training facilities and other providers, such as Regional headquarters offices and local offices.

SOO, Development and Operations Hydrologist (DOH), and Warning Coordination Meteorologist (WCM) Support: This supports each SOO, DOH and WCM by providing \$2,000 for each WHO, RFC and NCEP Service Center to share for local training needs. The funds are transferred directly to the Regions and NCEP for distribution to their respective field offices.

Regional Collaborative Projects: This supports NWS/university collaborative projects, workshops, and associated computer and travel needs not supported by COMET Outreach projects. The funds

are transferred directly to the Regions and NCEP for distribution to their respective field offices.

Professional Development Workstations (PDW) and Science Applications Computers (SAC) Maintenance: This supports routine maintenance costs for Professional Development Workstations (PDW) and Science Applications Computers (SAC).

Training Coordination: This supports participant travel to PDS, proficiency standards and NSTEP Team meetings as needed during the year.

Unidata Case Studies: This supports a project with the UCAR's Unidata corporation to work with NWS and COMET and place new hydrometeorological case studies used in the COMET classroom on their web server for access by the NWS and university communities.

COMET NWS Subject Matter Expert (SME) Travel: This supports SME travel in association with COMET classes and distance-learning module development.

COMET Outreach Support: This supports Government travel and publication costs associated with COMET Outreach projects.

American Meteorological Society (AMS) Journals: This supports purchasing the AMS journals "Monthly Weather Review" and "Weather and Forecasting" for all field offices and Regions via hard copy and Internet access. The NWS CFO's office also contributes a share of these costs.

IV. PRIORITIZED UNFUNDED TRAINING REQUIREMENTS FOR FY 2000

The following list shows the highest priority unfunded NWS training requirements for FY 2000, as determined by the FRG. Note while all but one of these is addressed among the funded requirements described in section III, it was not possible to fund some items to the extent required. The amounts shown in association with each item below would fully satisfy the specified requirements. The NWS Corporate Board will consider these funding requirements along with other NWS requirements. If funding is not available for all of these, the FRG recommends they be funded in the order presented below:

(1) SOO/DOH/WCM Support (\$140K): In the past, all SOOs, DOHs and WCMs have received \$3K per office for local training needs and have used these funds to great benefit. While the FRG agreed upon a 33 percent reduction in order to meet budget targets, this reduction will limit these local activities, especially in view of SOOs and WCMs having to share these funds.

(2) Regional Collaborative Funds (\$100K): These funds have been utilized very successfully in the past by the Regions to fund travel to local meetings and workshops and to procure computer hardware and software for collaborative applied research projects with local universities and research institutions. This cut limits the full requested range of these activities in FY 2000.

(3) Local IT Systems Funding (\$485K): Not providing the full funding for these items will result in some field staff not obtaining the fundamental IT knowledge essential for supporting the complex, integrated electronics systems which are now the backbone of the NWS. This impact especially would be realized at the point when NWS begins to infuse new technologies into operational, commissioned electronics systems and data ingest/flow networks. A proper level of IT training will enable NWS to build a solid IT infrastructure and make future agency decisions more readily adaptable. Finally, using commercially available IT training will reduce the burden on NWSTC of providing centralized IT training.

(4) COMET Hydromet Class (\$95K): The full complement of four COMET Hydromet classes are needed to ensure completion of this course by all WHO and RFC hydrology personnel who require it. Only three classes have been funded, which means 18 students will have to wait until FY 2001 to receive this training.

(5) COMET Satmet Class (\$66K): Two COMET Satmet classes are needed to complete this requirement for SOOs and WHO Satellite Focal Points. Only one class has been funded, which means 18 students will not receive this training until FY 2001.

(6) Local Facilities Training (\$100K): Not providing full funding for facilities training could result in disruptions to field operations and may also impact their efficiency. Disruptions could result from a lack of trained staff to repair failing generators, uninterruptable power supplies; heating, ventilation, and air conditioning systems; and electrical distribution systems. In addition, long-term cost risk may be introduced due to some staff not being properly trained in good maintenance practices, potentially shortening the life cycle of facilities systems, buildings, grounds, roads, and parking lots. Finally, the safety of the work environment may be compromised if some staff are not provided training in complying with building, electrical, mechanical, environmental, and safety codes and regulations.

(7) NWSTC AWIPS Applications Classes (\$32K): The FRG had originally requested nine of these high-priority classes associated with AWIPS commissioning but cut back to seven classes

during the prioritization process. This will delay training for 32 SOOs, DOHs, and AWIPS focal points until FY 2001.

(8) WHO/RFC Systems Administration Class (\$29K): The FRG originally identified the need for seven of these classes geared toward quickly spinning up ETs on NWS non-AWIPS field office systems but cut the number to six during the prioritization process. Thus, 16 students will have to wait until FY 2001 to receive this training.

(9) CRS Maintenance Class (\$16K): The FRG originally identified the need for six of these classes geared toward training Electronic Technicians on how to maintain critical Console Replacement Systems but cut the number to five during the prioritization process. Thus, 16 students will have to wait until FY 2001 to receive this training.

(10) Hydrology Workshops (\$33K): A series of 10 workshops were proposed to be held in FY 2000. The FRG recognized the benefits of all 10 workshops but cut the number to 6 as a contribution toward meeting budget targets. This will result in a slower rate of implementation for hydrologic forecasting technology.

(11) NCEP Post Doctoral Position (\$70K): The NWP PDS Team had originally proposed funding a total of three post doctoral positions in FY 2000 to work on developing distance-learning materials on PCUs but cut the number to two during the prioritization process. This will result in a slower rate of development of these important training materials.

(12) NCDC AWIPS Archive (\$92K): There is a critical need to establish an archive of NWS operational data so field staff can review data after they have been purged from the local AWIPS database. This archive capability will be the only means for retrieving the large volume of model and Geostationary Operational Environmental Satellite image products, which is especially important following significant weather events.

TOTAL UNFUNDED REQUEST: \$1,258K

V. TRAINING NEEDS IN FY 2001 AND BEYOND

In FY 2001 and beyond, the FRG expects the training program to continue to be driven by advances in AWIPS and by needs with respect to new remote-sensing technologies and numerical models. Specific expectations are listed below:

- * AWIPS Build 5 will be implemented starting in late FY 2000. Training will be required on using new Build 5 capabilities, including the WSR-88D Open Systems Radar Product Generator

(described below) and IFPS. This will include a full suite of IFPS managers and focal point classes in FY 2001.

- * NCEP will continue to improve the operational NWP models, and university and research numerical models will continue to proliferate and be utilized at the local level. Thus, the requirement to develop and update distance-learning materials on NWP will continue indefinitely.
- * The NWS requires training on the all-encompassing surface data acquisition PDS which would include the following:
 - Traditional Cooperative Program management training
 - Surface observations inspecting
 - Data acquisition quality control responsibilities and functions at the WHO level
 - Basic training in the proper use of Global Positioning Systems
 - Handling Automated Local Evaluation in Real Time system networks
 - Training on marine observations

The target audience for this training is all field office Data Acquisition Program Managers and HMTs, and regional and national headquarters personnel involved with overseeing these programs. The NSTEP Team plans a PDS meeting to further define these requirements and establish training plans during FY 2000.

- * The NWS will be fielding replacement computer hardware and software for the existing WSR-88D Radar Product Generator (RPG) in FY 2001. The modification of hardware and software requires NWS operations and maintenance personnel receive training to support the new RPG. WSR-88D operators require training on the new Human Computer Interface to optimize system performance and detect system failures, while maintenance personnel require training to diagnose system failures and take the appropriate corrective action to ensure system availability. WSR-88D Open RPG Operator Training delivered via distance learning (teletraining, Internet-based, and computer-based training) must be developed to support an early FY 2001 deployment. WSR-88D Open RPG Maintenance Training must be developed to conduct a sufficient number of classes to train personnel at Open RPG sites deployed in early FY 2001.
- * As plans for leadership training continue to evolve, funds will be needed to develop and offer courses in the areas of management and supervision, team leader training, and team member training to achieve the goals in the NWS Vision 2005 Strategic Plan.

- * The NWS Corporate Board is discussing the future duties for NWS HMTs. After the Corporate Board reaches a decision, the NSTEP Team will identify and respond to training needs associated with this decision.
- * As NOAA's plans for increased climate prediction services evolve, additional climate information training will have to be developed.

TABLE 1 - Residence Training Requirements: FY 2000

	Stu	Days	Funding	ER	SR	CR	WR	AR	PR	NCEP	OTH	Total Slots	Classes Proposed	Cost per Class	Total Cost
NWSTC EED															
ASOS Maintenance	9	13	ASOS	10	14	8	13	4	1	0	18	68	8	\$22,878	\$183,024
Intro to NWS Systems (New)	10	3	OSO Base	12	6	5	7	3	2	0	2	37	4	\$10,000	\$40,000
Art Rawin System	8	11	OSO Base	4	6	5	7	4	1	0	8	35	5	\$18,504	\$92,520
Hydrogen Generator	8	4	OSO Base	0	0	0	1	2	2	0	1	6	1	\$8,800	\$8,800
NWR Transmitter	4	3	OSO Base	4	4	2	10	4	1	0	1	26	6	\$4,000	\$24,000
WSR-88D Maintenance	8	30	NEXRAD	10	8	8	8	0	2	0	8	44	6	\$42,400	\$254,400
88D MLOS Maint	8	3	NEXRAD	0	0	0	4	0	0	0	2	6	1	\$8,000	\$8,000
WSR-88D Dual-Thread Adjunct	8	3	NEXRAD	0	0	0	4	0	1	0	7	12	2	\$8,000	\$16,000
INFORMIX Overview	16	3.5	AWIPS	6	8	4	6	1	1	2	4	32	2	\$16,000	\$32,000
AWIPS Systems Manager (New)	16	12	AWIPS	26	35	40	27	4	3	4	5	144	9	\$28,800	\$349,200
AWIPS Applications (New)	16	3.5	AWIPS	21	27	30	20	3	3	3	5	112	7	\$16,000	\$112,000
WFO/RFC Systems Admin. (New)	16	8	MARDI	24	25	12	12	4	3	5	11	96	6	\$28,800	\$172,800
CRS Maintenance	16	3.5	MARDI	15	21	20	12	3	3	0	6	80	5	\$16,000	\$80,000
NWSTC HMD															
Supervisory Leadership Course	48	8	MARDI	8	12	14	9	1	1	1	2	48	1	\$86,400	\$86,400
Guest Instr./Pre-Req costs	-	-	MARDI	-	-	-	-	-	-	-	-	-	-	\$10,000	\$10,000
Coop Network Ops.	16	8	MARDI	13	23	20	17	5	2	0	0	80	5	\$28,800	\$144,000
WHFS Workshop	8	3.5	AWIPS	12	10	14	6	4	1	0	0	47	6	\$8,000	\$48,000
WHFS Admin Travel	-	-	AWIPS	-	-	-	-	-	-	-	-	-	-	\$5,000	\$5,000
IFPS Managers	10	2	AWIPS	9	7	8	0	0	0	0	6	30	3	\$9,000	\$27,000
IFPS Focal Point	9	8.5	AWIPS	12	5	5	0	0	0	2	3	27	3	\$16,200	\$48,600
IFPS Delta	10	3.5	AWIPS	2	4	4	0	0	0	0	0	10	1	\$10,000	\$10,000
COMET															
Hydromet	18	14	MARDI	9	22	10	7	3	3	0	0	54	3	\$49,500	\$148,500
NWP Symposia	27	4	MARDI	12	15	12	12	1	1	2	0	55	2	\$29,700	\$59,400
Heavy Rainfall Symposia	27	4	MARDI	10	13	16	10	2	2	3	0	56	2	\$29,700	\$59,400
SatMet	18	9	MARDI	2	1	3	5	2	2	3	0	18	1	\$36,000	\$36,000
OTB Workshops															
WDM I Workshop	27	3.5	NEXRAD	14	20	23	15	2	2	3	2	81	3	\$27,000	\$81,000
WDM II Workshop	27	3.5	NEXRAD	14	20	23	15	2	2	3	2	81	3	\$27,000	\$81,000
General Costs/Instr. Travel	-	-	NEXRAD	-	-	-	-	-	-	-	-	-	-	\$18,000	\$18,000

Summary

Needed

NWSTC HMD MARDI	\$240,400
NWSTC EED MARDI	\$252,800
COMET MARDI (residence)	\$303,300
TOTAL MARDI	\$796,500
NWSTC HMD AWIPS	\$138,600
NWSTC EED AWIPS	\$493,200
TOTAL AWIPS	\$631,800
NWSTC EED Base (OSO)	\$165,320
NWSTC ASOS	\$183,024
NWSTC EED NEXRAD	\$278,400

Assumptions:

Cost/student

2 days	\$900
3/3.5 days	\$1,000
4 days	\$1,100
8/8.5 days	\$1,800
11 days	\$2,313
12 days	\$2,425
13 days	\$2,542
14 days	\$2,750
30 days	\$5,300

**TABLE 2 - FY 2000 Training and Science Support Budget
(MARDI and Base Segregated)**

	<u>MARDI</u>	<u>NEXRAD</u>	<u>BASE</u>	<u>AWIPS</u>	<u>ASOS</u>	<u>Total</u>
Labor						
NWSTC (30 FTEs)		\$151,000	\$2,000,000		\$14,000	\$2,165,000
OSF/OTB		\$762,900				\$762,900
OM at COMET			\$320,000			\$320,000
Non-Labor/PCS Costs						
NWSTC			\$750,000			\$750,000
OSF/OTB		\$1,054,300				\$1,054,300
COMET Grant	\$1,464,000					\$1,464,000
COMET Grant (AWIPS)				\$1,912,000		\$1,912,000
AWIPS						
AWIPS Systems Manager (New)			\$87,000	\$262,200		\$349,200
AWIPS Applications (New)			\$65,000	\$47,000		\$112,000
WFO/RFC Systems Admin. (New)	172,000					\$172,000
IFPS Managers			\$27,000	\$0		\$27,000
IFPS Focal Point			\$48,600	\$0		\$48,600
IFPS Delta			\$10,000	\$0		\$10,000
Integrated Sensor Training						
Int. Sensor CI Salaries	\$400,000					\$400,000
WDM I Workshop		\$81,000				\$81,000
General Cost/Instruct. travel		\$9,000				\$9,000
SatMet (COMET)	\$36,000					\$36,000
Convective Warning Process						
WDM II Workshop		\$81,000				\$81,000
General Cost/Instruct. travel		\$9,000				\$9,000
Numerical Weather Prediction						
NCEP Model Training Salaries	\$140,000					\$140,000
NWP Symposia (COMET)	\$59,400					\$59,400
QPF						
Heavy Rainfall Symposia (COMET)	\$59,400					\$59,400
DL Team at COMET			\$500,000			\$500,000
Hydro						
WHFS Workshop				\$48,000		\$48,000
WHFS Admin Travel			\$3,200	\$2,800		\$6,000
WHFS Manual			\$40,000	\$0		\$40,000
UCAR Visiting Scientists/WHFS	\$45,000					\$45,000
Hydrology Workshops	\$60,000					\$60,000
Hydro Univ. Corr. Courses	\$60,000					\$60,000
New Hydro WWW Modules	\$94,000					\$94,000
New "Managing Hydro" Res Course	\$50,000					\$50,000
Hydromet (COMET)	\$148,500					\$148,500
INFORMIX Overview				\$32,000		\$32,000
Engineering, Electronics, Facilities						
ASOS Maintenance					\$183,000	\$183,000
Intro to NWS Systems (New)			\$40,000			\$40,000
Art Rawin System			\$92,520			\$92,520
Hydrogen Generator			\$8,800			\$8,800
NWR Transmitter			\$24,000			\$24,000
WSR-88D Maintenance		\$254,400				\$254,400
WSR-88D MLOS Maint		\$8,000				\$8,000
WSR-88D NWS Dual-Thread Adjunct		\$16,000				\$16,000
CRS Maintenance	\$80,000					\$80,000
Local IT Systems Training	\$515,000					\$515,000
Local Facilities Training	\$200,000					\$200,000
MGMT Training						
Supervisory Leadership Course	\$86,400					\$86,400
Guest Instructors/Pre-Req costs	\$20,000					\$20,000
Coop Network Ops. Course	\$144,000					\$144,000
Climate (NCEP staff time only)						
Aviation (incl. in COMET CBL dev.)						
Other Non-PDS Program Funds						
Teletraining Risk Reduction	\$25,000					\$25,000
Teletraining Comms	\$75,000					\$75,000
SOO, DOH, and WCM Support	\$280,000					\$280,000
Regional Collaborative Proj.	\$240,000					\$240,000
PDW & SAC Maintenance	\$50,000					\$50,000
Training Coordination	\$40,300					\$40,300
Unidata Case Studies	\$100,000					\$100,000
COMET NWS SME Travel	\$80,000					\$80,000
COMET Outreach Support	\$50,000					\$50,000
AMS Journals	\$30,000		\$55,000			\$85,000
TOTAL: TRNG. & SCI. SUPPORT BUDGET	\$4,804,000	\$2,426,600	\$4,071,120	\$2,304,000	\$197,000	\$13,802,720